

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 460805 GWW	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. CT/NZ2002/000055	International Filing Date (day/month/year) 3 April 2002	Priority Date (day/month/year) 3 April 2002	
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ B82B 3/00, C01B 31/02, D01F 9/12			
Applicant CANTERPRISE LIMITED et al			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheet(s).

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 31 October 2003	Date of completion of the report 6 July 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer ZOE BRADY Telephone No. (02) 6283 7947

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/NZ2002/000055

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed.
- ☒ the description, pages 1-4, 6-10, as originally filed,
pages , filed with the demand,
pages 5, received on 25 June 2004 with the letter of 25 June 2004
- ☒ the claims, pages 11, 12, as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages 13, received on 25 June 2004 with the letter of 25 June 2004
- ☒ the drawings, pages Fig 1 - Fig 5, as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/NZ2002/000055

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Statement

Novelty (N)	Claims 1-23	YES
	Claims	NO
Inventive step (IS)	Claims 1-23	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-23	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

D1: JP 11-263610 A

D2: JP 11-310407 A

Novelty (N) and Inventive Step (IS) Claims 1-23

The present invention is directed to a method of forming nanoscale carbon hollow inorganic fibrils or nanotubes by moving a carbon-containing substrate through a reaction chamber either through an electric arc in a gap between two electrodes or adjacent an electrode so that an electric arc exists between the electrode and the substrate to cause the nanotubes to form on the substrate.

No individual citation or obvious combination of citations disclose this arrangement.

Documents D1 and D2, listed above, represent close prior art. Document D1 discloses a method for producing nanotubes in which a sample holder 14 containing a sample 10 of SiC compacted powder (D1: para [0010], fig 1) is positioned adjacent an electrode 20, so that when an arc is generated between the sample base 14 and electrode 20 (D1: para [0012]) a carbon nanotube layer is formed on the surface of the SiC. Therefore, D1 does not disclose movement of a substrate through an arc. Document D2 discloses use of a cylinder-like PTFE film in which electrodes are placed inside the cylinder (see D2: Example). Generating an arc between the inter-electrodes carbonizes the PTFE film and a carbon nanotube layer is formed on the film. Although the nanotubes are formed on a substrate, the PTFE film is not moved through the electric arc nor is it adjacent an electrode so that an electric arc exists between the electrode and film, as defined in the present claims. Instead, the electric arc is generated inside the PTFE cylinder. The advantage of the present invention is that movement of the substrate relative to an arc causes nanotubes to form on the substrate, in a continuous or semi-continuous nanotube production process rather than a batch process as in the prior art. Therefore, the claims are novel and inventive.